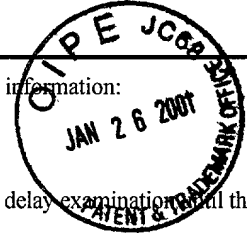


FORM PTO-1390		U S DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 713-426
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371			U.S. APPLICATION NO. (if known, see 37 CFR 1.5) 09/744587
INTERNATIONAL APPLICATION NO. PCT/IT99/00247 ✓	INTERNATIONAL FILING DATE 28 July 1999 (28.07.99) ✓	PRIORITY DATE CLAIMED 28 July 1998 (28.07.98)	
TITLE OF INVENTION ELECTRONIC GAS-LIGHTING DEVICE INTEGRATED WITH A TERMINAL BOARD ✓			
APPLICANT(S) FOR DO/EO/US Massimo ALEARDI ✓ and Raoul BIANCHI ✓			
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:			
<p>1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371.</p> <p>2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371.</p> <p>3. <input type="checkbox"/> This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).</p> <p>4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.</p> <p>5. <input checked="" type="checkbox"/> A copy of the International Application as filed (35 U.S.C. 371(c)(2))</p> <p>a. <input type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input checked="" type="checkbox"/> has been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US)</p> <p>6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)).</p> <p>7. <input checked="" type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))</p> <p>a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau).</p> <p>b. <input type="checkbox"/> have been transmitted by the International Bureau.</p> <p>c. <input type="checkbox"/> have not been made; however, the time limit for making such amendment has NOT expired.</p> <p>d. <input checked="" type="checkbox"/> have not been made and will not be made.</p> <p>8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).</p> <p>9. <input type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).</p> <p>10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).</p> <p>Items 11. to 16. below concern other document(s) or information included:</p> <p>11. <input checked="" type="checkbox"/> An Information Disclosure Statement under 37 CFR 1.97 and 1.98.</p> <p>12. <input type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.</p> <p>13. <input type="checkbox"/> A FIRST preliminary amendment.</p> <p><input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment.</p> <p>14. <input type="checkbox"/> A substitute specification.</p> <p>15. <input type="checkbox"/> A change of power of attorney and/or address letter.</p> <p>16. <input checked="" type="checkbox"/> Other items or information.</p> <p>a. PCT/RO/101</p> <p>b. PCT/IB/308 – Notice Informing the Applicant of the Communication of the International Application to The Designated Offices</p> <p>c. PCT/ISA/220 – Notification Of The International Search Report or the Declaration</p> <p>d. PCT/ISA/210 – International Search Report and Prior Art Documents</p> <p>e. PCT/IPEA/401 – Demand Under Article 31 of the Patent Cooperation Treaty</p> <p>f. PCT/IPEA/416 – Notification of Transmittal of the International Preliminary Examination Report</p> <p>g. PCT/IPEA/409 – International Preliminary Examination Report</p>			



5

ELECTRONIC GAS-LIGHTING DEVICE INTEGRATED WITH A
TERMINAL BOARD

10

TECHNICAL FIELD

The present invention relates to an electronic gas-lighting device integrated with a supply terminal board and so connectable directly to the wires of a supply cable.

15

BACKGROUND ART

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Increasing demand for integrated components is also felt in the electric household appliance industry to simplify and speed up component assembly to the appliance, and in particular to the appliance body. In the case of gas cookers, and also built-in cooking ranges, components typically fitted to the appliance body, or to the cooking range, are the electronic gas-lighting device and the supply terminal board. The terminal board is designed to receive and retain the cable powering the various electric devices (e.g. lights, burner lighter, etc.) and, above all, to ground the appliance body and/or cooking range, which are

conducting metal elements. The electronic gas-lighting device, on the other hand, is the main device to be powered, and provides for lighting the burners by means of respective high-voltage terminals, which are
5 connected by conducting wires to electrodes fitted to the range, close to the burners which, being grounded via the range, act as counterelectrodes.

The above integration problems are known to be solved using a standard terminal board having a
10 supporting body shaped to house a standard lighting device complete with a respective independent casing, so that the lighting device is preassembled to the terminal board, which is then fitted to the appliance in one operation. Though the time taken to fit the components
15 to the appliance is reduced, the above solution has the drawback of increasing the time taken to assemble the components and the cost of the components themselves. Moreover, in most applications, using a standard terminal board designed for high currents (e.g. 12 amps)
20 is a pointless waste.

DISCLOSURE OF INVENTION

It is an object of the present invention to provide an integrated device designed to eliminate the
aforementioned drawbacks, and which, in particular, is
25 cheap and easy to produce, can be assembled quickly and easily, and may be used indifferently for cooking ranges or for more complex electric household appliances such

as gas cookers.

According to the present invention, there is provided an electronic gas-lighting device integrated with a terminal board, the device comprising a casing
5 made of insulating material; electronic high-voltage-pulse generating means including at least one transformer having a secondary winding, the ends of which are connected to respective high-voltage terminals; and assembly means for removably fitting said
10 casing to a supporting surface of a conducting metal body element of an electric household appliance, in particular a cooking range with gas burners; characterized in that said casing is fitted directly with respective supply contacts located on a specially
15 shaped portion of the casing to form a supply terminal board, which is connected exclusively and solely to said electronic high-voltage-pulse generating means, and to which are connectable the wires of a supply cable.

More specifically, the casing is made of molded
20 synthetic plastic material, and comprises a cup-shaped body, a cavity of which houses said at least one transformer; and a box portion, which is formed integrally with the cup-shaped body, houses at least part of said electronic high-voltage-pulse generating
25 means, and is fitted directly with said respective supply contacts which are arranged on the box portion to form, together with the box portion, said terminal

board.

The terminal board may therefore be designed solely bearing in mind the maximum current relating to the gas-lighter (less than 1 amp), thus enabling a reduction in the size of the terminal board. Moreover, all the terminal board and gas-lighter components are carried by the same casing and wired directly to one another inside the casing, which provides for component saving, reducing size and weight, simplifying assembly, and possibly also electrically connecting the terminal board contacts directly to a component, e.g. a printed circuit, of the gas-lighter.

In a preferred embodiment, the terminal board contacts, which are Faston types, are clicked onto an inner first face of the box portion, and one of them, which acts as a ground contact, has a tongue projecting outwards of the box portion and parallel to and facing a second face of the box portion opposite the first, so that the appliance body (or cooking range) can be grounded by simply fitting the tongue to it. Being parallel to the axial extension of the box portion, the tongue in no way prevents the device from being inserted into or removed from the appliance, regardless of whether this is done from the inside or outside of the appliance body.

Finally, on the second face side, the box portion of the casing comprises an integral connector for

connecting the high-voltage-pulse generating means to respective control means of the appliance; and the cup-shaped body carries said high-voltage terminals housed inside through ducts formed integrally with a bottom wall of the cup-shaped body perpendicular to the first and second face of the box portion, thus preventing, in use, any possible crossover of the catenary control cables and the high-voltage cables to the burners.

BRIEF DESCRIPTION OF DRAWINGS

10 A non-limiting embodiment of the present invention will be described by way of example with reference to the accompanying drawings, in which:

- Figure 1 shows a longitudinal elevation of the integrated device according to the invention;

15 - Figure 2 shows a partially sectioned longitudinal view of the Figure 1 device rotated 90°;

Figure 3 shows a section along line III-III of the Figure 2 device.

BEST MODE FOR CARRYING OUT THE INVENTION

20 Number 1 in Figures 1 to 3 indicates as a whole an electronic gas-lighting device, which, according to the invention, is integrated with a terminal board 2 for supplying the device. More specifically, device 1 is designed for use on a known electric household appliance (not shown) such as a gas cooker or cooking range with gas burners or a gas oven lit electrically.

Device 1 comprises a casing 3 made of insulating

material; electronic high-voltage-pulse generating means 4 (known and therefore not described in detail for the sake of simplicity) in turn comprising one or more transformers 5, each having a secondary winding 6 (Figure 1), the ends of which are connected to respective known high-voltage terminals 8 (Figure 2); and assembly means, defined by teeth 9 and 10, for fitting insulating casing 3 removably to a supporting surface 11 of a conducting metal body element 12 of an electric household appliance, in particular defined by a cooking range with known gas burners (not shown for the sake of simplicity).

According to the invention, casing 3 is fitted directly with supply contacts 15, 16 located on a specially shaped portion 18 of the casing, so that contacts 15, 16 and portion 18 form a supply terminal board 2 fully and closely integrated with the gas-lighting device, and which, as will be seen, is connected exclusively and solely to electronic high-voltage-pulse generating means 4, and is designed to receive the wires of a known supply cable (not shown for the sake of simplicity).

More specifically, the casing is made of molded synthetic plastic material, and comprises a cup-shaped body 19, a cavity 20 of which houses transformer/s 5 (in the example shown, two transformers 5); and portion 18, which is substantially in the form of a parallelepiped-

shaped box and is formed integrally with cup-shaped body 19. Box portion 18 has a bottom wall defining two opposite faces: an outer face 21 facing, in use, surface 11 of body 12; and an inner face 22. On the face 22 side, box portion 18 houses at least part of said electronic high-voltage-pulse generating means 4 (shown schematically by a dash line), including at least part of a known printed circuit 25 (or connecting board supporting an electric track circuit), and is fitted directly on face 22, with said supply contacts 15 and 16.

Contacts 15, 16 are defined by Façon blade contacts clicked in known manner, not shown, onto face 22 and each having a respective known screw terminal for receiving both terminated and nonterminated wires.

Teeth 9 are substantially rigid and L-shaped, while tooth 10 is elastically deformable, so that all click in known manner onto opposite edges of the same opening, or, as in the example shown, onto respective through openings 30, 31 in metal body element 12 of the appliance. Teeth 9, 10 are formed integrally with casing 3 and project perpendicularly from face 21.

Contact 16, between two contacts 15, is a ground contact and, according to one aspect of the invention, comprises an integral T-shaped tongue 33 which projects outwards of box portion 18, is bent into an L to extend longitudinally parallel to and facing face 21, on the same side as teeth 9, 10, and is separated from face 21

by such a distance as to contact surface 11 when teeth 9, 10 engage openings 30, 31. Tongue 33 also comprises two (or at least one) known fastening holes 35 for fitment to metal body element 12 of the appliance. The
5 above design and location of tongue 33 between teeth 9 and 10 enable use of the tongue to ground body element 12 with no increase in the normal overall transverse size of casing 3, thus enabling device 1 to be fitted to the appliance from both the inside and outside.

10 According to a further aspect of the invention, box portion 18 comprises, on the face 21 side, an integral connector 37 (e.g. a JST type) for connecting electronic high-voltage-pulse generating means 4 to respective known control means (not shown) of the appliance.

15 In conjunction with the above characteristic, cup-shaped body 19 comprises an access opening 38 to cavity 20, and a bottom wall 39 opposite and facing opening 38, both of which lie in planes perpendicular to the plane of faces 21 and 22 of box portion 18, i.e. are oriented
20 perpendicular to faces 21 and 22. Bottom wall 39 comprises a number of through ducts 40, each housing a terminal 8, so that terminals 8 and contact 16 face opposite ways, thus preventing crossover of the respective connected wires.

25 Finally, portion 18 may comprise a known cable clamping device 50, shown only schematically, to complete terminal board 2.

CLAIMS

1) An electronic gas-lighting device integrated with a terminal board, the device comprising a casing made of insulating material; electronic high-voltage-pulse generating means including at least one transformer having a secondary winding, the ends of which are connected to respective high-voltage terminals; and assembly means for removably fitting said casing to a supporting surface of a conducting metal body element of an electric household appliance, in particular a cooking range with gas burners; characterized in that said casing is fitted directly with respective supply contacts located on a specially shaped portion of the casing to form a supply terminal board, which is connected exclusively and solely to said electronic high-voltage-pulse generating means, and to which are connectable the wires of a supply cable.

2) An integrated device as claimed in Claim 1, characterized in that said casing is made of molded synthetic plastic material, and comprises a cup-shaped body, a cavity of which houses said at least one transformer; and a box portion, which is formed integrally with the cup-shaped body, houses at least part of said electronic high-voltage-pulse generating means, and is fitted directly with said respective supply contacts which are arranged on the box portion to

form, together with the box portion, said terminal board; said respective supply contacts being defined by Faston blade contacts clicked onto an inner first face of said box portion of the casing, and each having a
5 respective screw terminal.

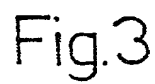
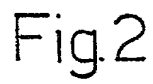
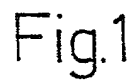
3) An integrated device as claimed in Claim 2, characterized in that said assembly means comprise two teeth, at least one of which is elastically deformable, and which click onto at least one opening in said
10 conducting metal body element of the appliance; said teeth being formed integrally with said casing, and projecting perpendicularly from an outer second face, opposite the first face, of said box portion of the casing; one of said respective supply contacts being a
15 ground contact, and comprising an integral tongue projecting outwards of the box portion of the casing, on the same side as said teeth; said tongue being located parallel to and facing said second face, and at such a distance from the second face as to contact said
20 conducting metal body element of the appliance when said teeth engage said at least one opening; said tongue having at least one respective fastening hole for fitment to said conducting metal body element of the appliance.

25 4) An integrated device as claimed in Claim 3, characterized in that, on said second face side, said box portion of the casing comprises an integral

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connector for connecting the high-voltage-pulse generating means to respective control means of the appliance.

- 5) An integrated device as claimed in Claim 4,
5 characterized in that said cup-shaped body comprises an access opening to said cavity; and a bottom wall opposite and facing said access opening and comprising a number of through ducts, each housing one of said high-voltage terminals; said bottom wall and said access
10 opening lying in planes perpendicular to the plane of said first and second face of the box portion.'



DECLARATION FOR PATENT APPLICATION AND APPOINTMENT OF ATTORNEY

As a below-named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name; I believe that I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention (Design, if applicable) entitled: ELECTRONIC GAS-LIGHTING DEVICE INTEGRATED WITH A TERMINAL BOARD

the specification of which (check one):

is attached hereto.

was filed on _____ as Application Serial No. _____

was filed on 28 July 1999 as International Application (PCT) No. PCT/IT99/00247, and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment(s) referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with *Title 37, Code of Federal Regulations, § 1.56*. I hereby claim foreign priority benefits under *Title 35, United States Code § 119* of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which the priority is claimed.

PRIOR FOREIGN APPLICATION(S)

NUMBER	COUNTRY	DAY/MONTH/YEAR FILED	PRIORITY CLAIMED
TO98A000653	Italy	28/07/98	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
			<input type="checkbox"/> Yes <input type="checkbox"/> No

I hereby claim the benefit under *Title 35, United States Code, § 120* of any United States application(s) or PCT international application(s) designating The United States of America listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in that/those prior application(s) in the manner provided by the first paragraph of *Title 35, United States Code, § 112*, I acknowledge the duty to disclose material information as defined in *Title 37, Code of Federal Regulations, § 1.56* which occurred between the filing date of the prior application(s) and the national or PCT international filing date of this application:

APPLICATION NUMBER	FILING DATE	STATUS (Patented, Pending or Abandoned)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine, or imprisonment, or both, under *Section 1001 of Title 18 of the United States Code*, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

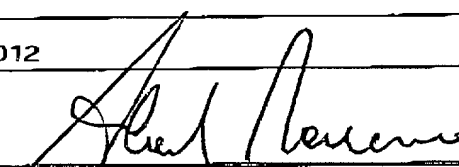
POWER OF ATTORNEY: I (We) hereby appoint as my (our) attorneys, with full powers of substitution and revocation, to prosecute this application and transact all business in the Patent and Trademark Office connected therewith: Allan M. Lowe, Registration Number 19,641; Benjamin J. Hauptman, Registration Number 29,310; Michael G. Gilman, Registration Number 19,114; Kenneth M. Berger, Registration Number 37,093; and Randy A. Noranbrock, Registration Number 42,940.

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I hereby authorize the U.S. attorneys and agents named herein to accept and following instructions from YON HAP International Patent & Law Office as to any actions to be taken in the U.S. Patent and Trademark Office regarding this application without direct communication between the U.S. attorneys and the undersigned. In the event of a change in the person(s) from whom instructions may be taken, the U.S. attorneys will be so notified by the undersigned.

See following page(s) for additional joint inventors.

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DECLARATION FOR PATENT APPLICATION AND APPOINTMENT OF ATTORNEY

Page 2

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